

computer system (referred to generally herein as a “computer system”). Such implementations may include a series of computer instructions fixed either on a tangible medium, such as a computer readable medium (e.g., a diskette, CD-ROM, ROM, EPROM, EEPROM, or fixed disk) or transmittable to a computer system, via a modem or other interface device, such as a communications adapter connected to a network over a medium. The medium may be either a tangible medium (e.g., optical or analog communications lines) or a medium implemented with wireless techniques (e.g., microwave, infrared or other transmission techniques). The series of computer instructions may embody desired functionalities previously described herein with respect to the system. Those skilled in the art should appreciate that such computer instructions can be written in a number of programming languages for use with many computer architectures or operating systems.

[0480] Furthermore, such instructions may be stored in any memory device, such as semiconductor, magnetic, optical or other memory devices, and may be transmitted using any communications technology, such as optical, infrared, acoustic, radio, microwave, or other transmission technologies. It is expected that such a computer program product may be distributed as a removable medium with accompanying printed or electronic documentation (e.g., shrink wrapped software), preloaded with a computer system (e.g., on system ROM, EPROM, EEPROM, or fixed disk), or distributed from a server or electronic bulletin board over the network (e.g., the Internet or World Wide Web). Of course, some embodiments of the invention may be implemented as a combination of both software (e.g., a computer program product) and hardware. Still other embodiments of the invention are implemented as entirely hardware, or substantially in software (e.g., a computer program product).

[0481] It should be noted that dimensions, sizes, and quantities listed herein are exemplary, and the present invention is in no way limited thereto. In an exemplary embodiment of the invention, a patch-sized fluid delivery device may be approximately 6.35 cm (~2.5 in) in length, approximately 3.8 cm (~1.5 in) in width, and approximately 1.9 cm (~0.75 in) in height, although, again, these dimensions are merely exemplary, and dimensions can vary widely for different embodiments.

[0482] While the principles of the invention have been described herein, it is to be understood by those skilled in the art that this description is made only by way of example and not as a limitation as to the scope of the invention. Other embodiments are contemplated within the scope of the present invention in addition to the exemplary embodiments shown and described herein. Modifications and substitutions by one of ordinary skill in the art are considered to be within the scope of the present invention.

What is claimed is:

1. A method of making a needle injector device for connection in fluid-flow communication with the inlet or outlet port of a reservoir, the method comprising:

- providing a housing comprising an opening;
- supporting a hollow needle in the housing for movement, the needle having a piercing end having an opening and an opposite, second end having an opening;

connecting a fluid conduit to the opening on the second end of the hollow needle for movement with the hollow needle, the fluid conduit being connectable to the outlet or inlet port of the reservoir;

supporting a cannula for movement with the needle to the extended position of the needle;

connecting a lever member in a fixed relation to the hollow needle and extending an extension portion of the lever member through the opening in the housing;

arranging a first bias member to impart a first bias force on the lever in a first direction, for moving the lever and the attached needle free of manual input; and

arranging a second bias member to impart a second bias force on the lever in a second direction, opposite to the first direction, for moving the lever and the attached needle while leaving the cannula in the extended position;

wherein at least a portion of the first bias member is located outside the housing, and

wherein at least a portion of the second bias member is located outside the housing.

2. A method as recited in claim 1, further comprising providing a lock structure for locking the first bias member in a state at which the first bias member is ready to impart a bias force on the lever member, but does not impart its full force on the lever and for selectively releasing the first bias member to impart its full force on the lever.

3. A method as recited in claim 2, wherein arranging the first bias member comprises arranging a bias member that is configured such that upon releasing the first bias member, the first bias member imparts a force on the lever member that overpowers the force of the second bias member, to move the lever member and attached needle from a start position to an extended position against the bias force of the second bias member.

4. A method as recited in claim 3, wherein the lever member is configured to be released from the first bias member, upon the lever member being moved to the extended position, to allow the bias force of the second bias member to move the lever member and attached needle to a retracted position.

5. A method as recited in claim 4, wherein the lever member comprises a bendable or breakable portion that bends or breaks to disengage from the first bias member, upon the lever member being moved by the first bias member to the extended position.

6. A method as recited in claim 2, wherein the lock structure is configured to selectively release the first bias member upon pivoting of the lock structure.

7. A method as recited in claim 1, wherein the first bias member comprises a first spring and the second bias member comprises a second spring.

8. A method as recited in claim 7, wherein the first bias member is arranged to impart the first bias force on the extension portion of the lever member outside of the housing.

9. A method as recited in claim 7, wherein the second bias member is arranged to impart the second bias force on the extension portion of the lever member outside of the housing.

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